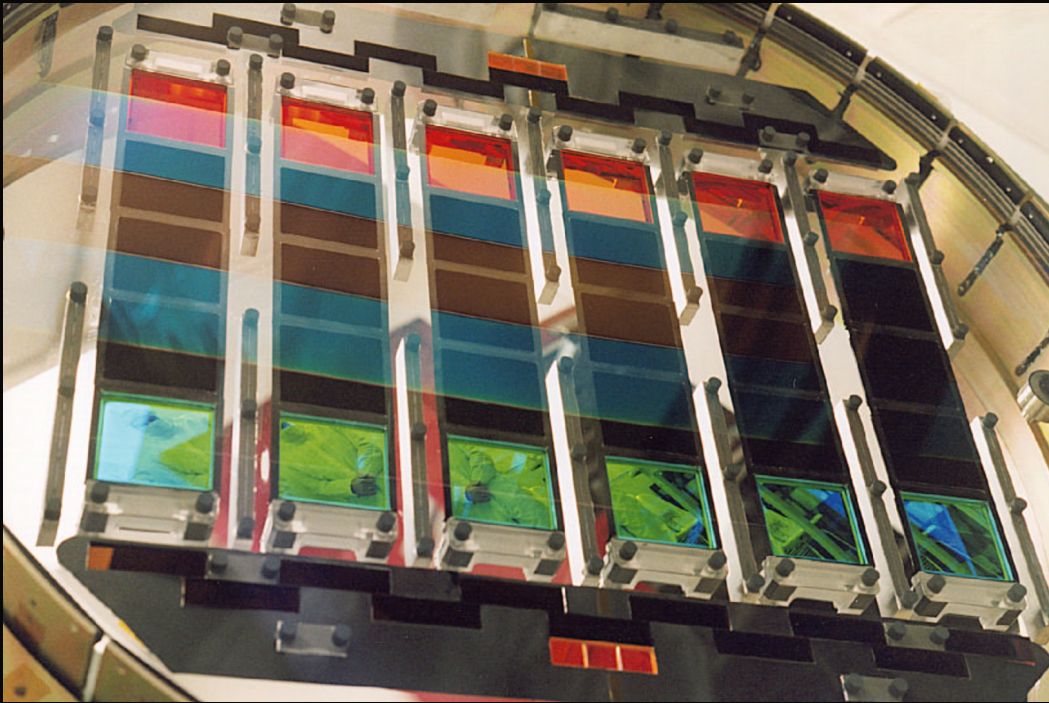


The SDSS Imaging Camera



- 2.5° dia. field
- 2 passes
- 54 CCDs
- 24μ , 0.4"/pix
- 30 Gby/hr

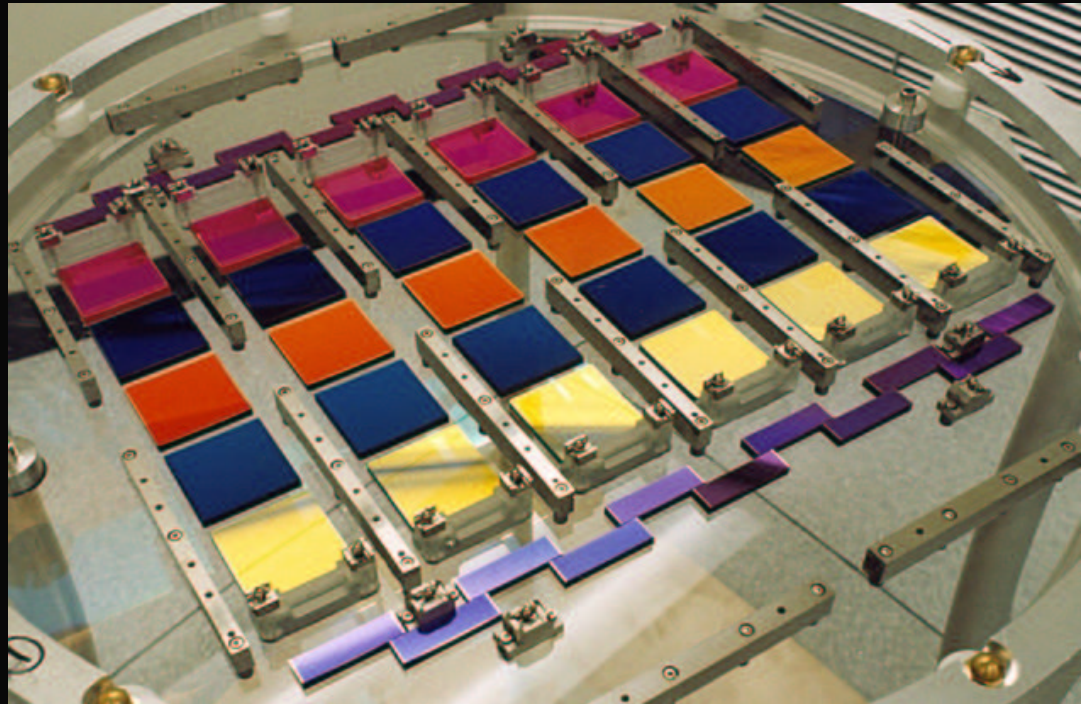
- Built on optical corrector
- Driftscanning

Imaging Survey Science Drivers

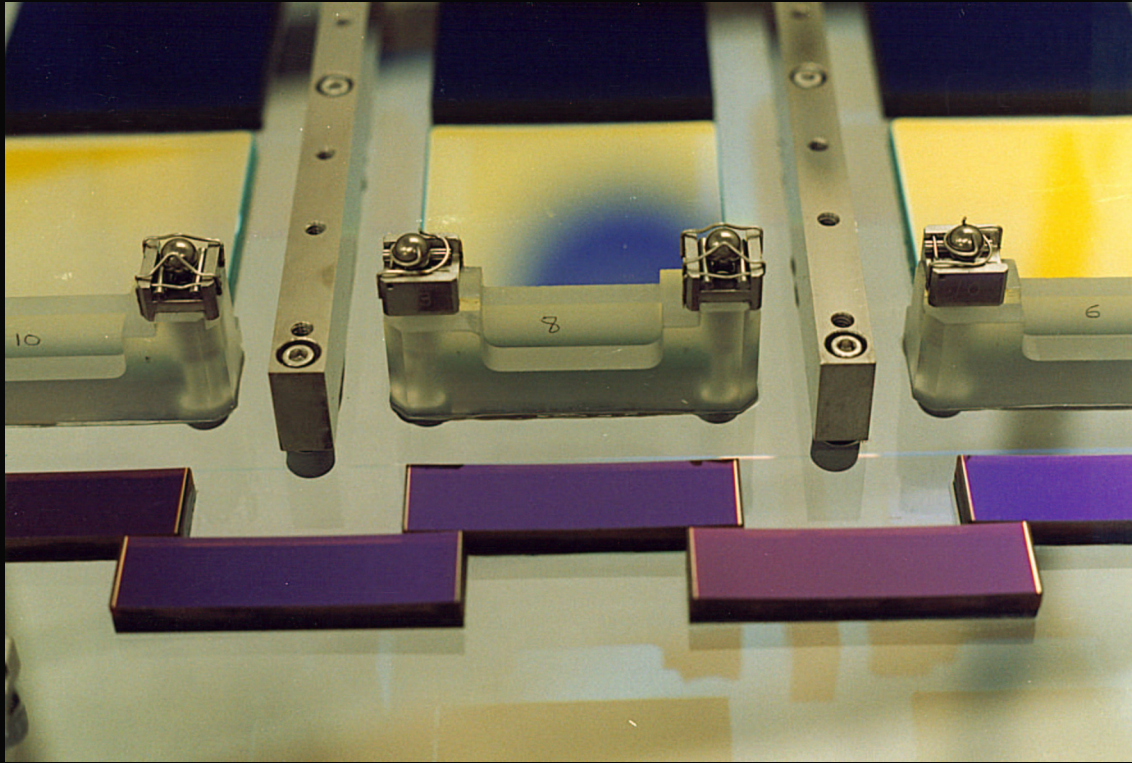
- Spectroscopic targets from Imaging Survey
 - Automated pipeline processing
-
- | | | |
|-----------------------------|---|----------------------|
| • Morphology | ➔ | Image Quality |
| • Astrometry | ➔ | Mechanical Stability |
| • SEDs | ➔ | 5 Filters, UV -> IR |
| • Homogeneous and Isotropic | ➔ | Data Stability |
| • Efficient | ➔ | Details, details |

Driftscanning

- Max efficiency for given $A\Omega Q$
- Sidereal-rate great circles
- 30 independent scanlines
- 5 filters 5 min.
- 2D→1D

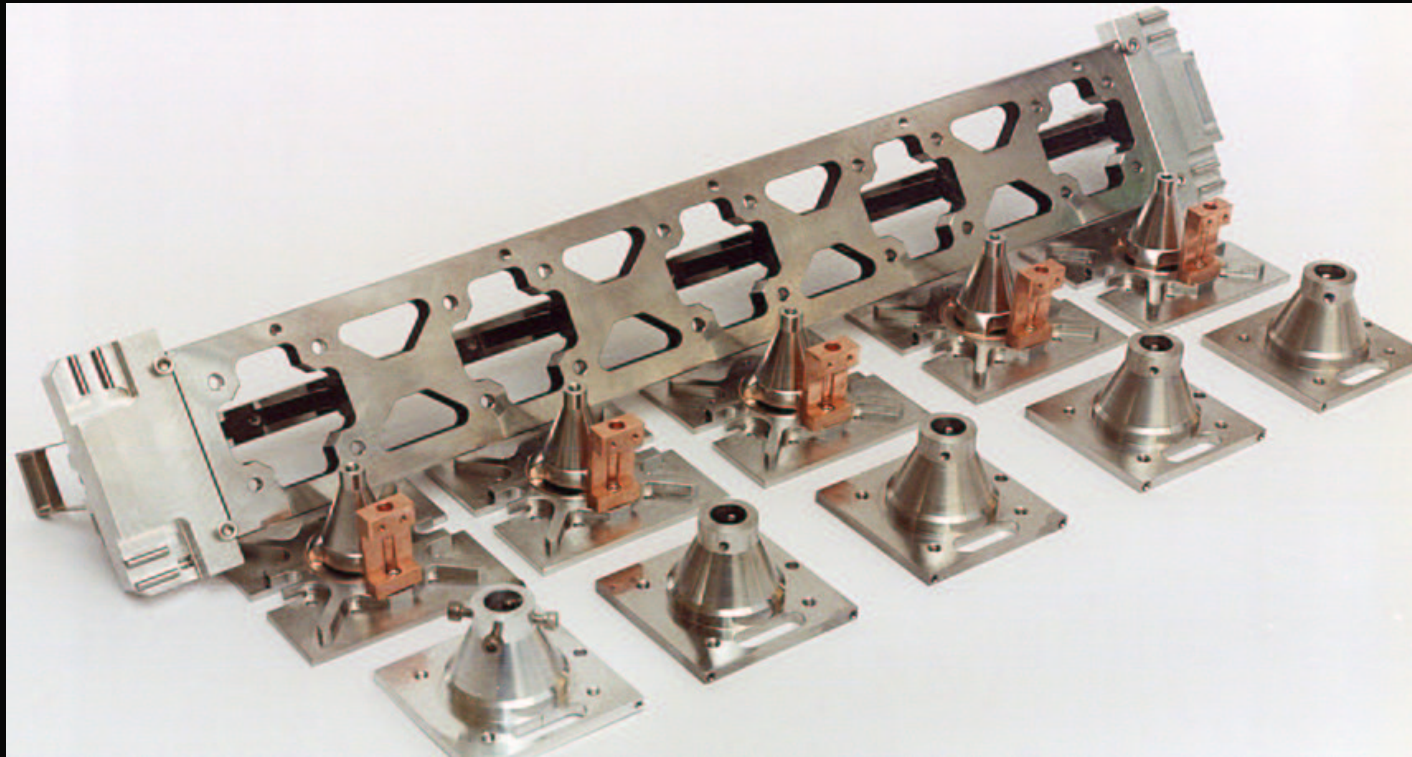


Focal Plane Mechanical Support



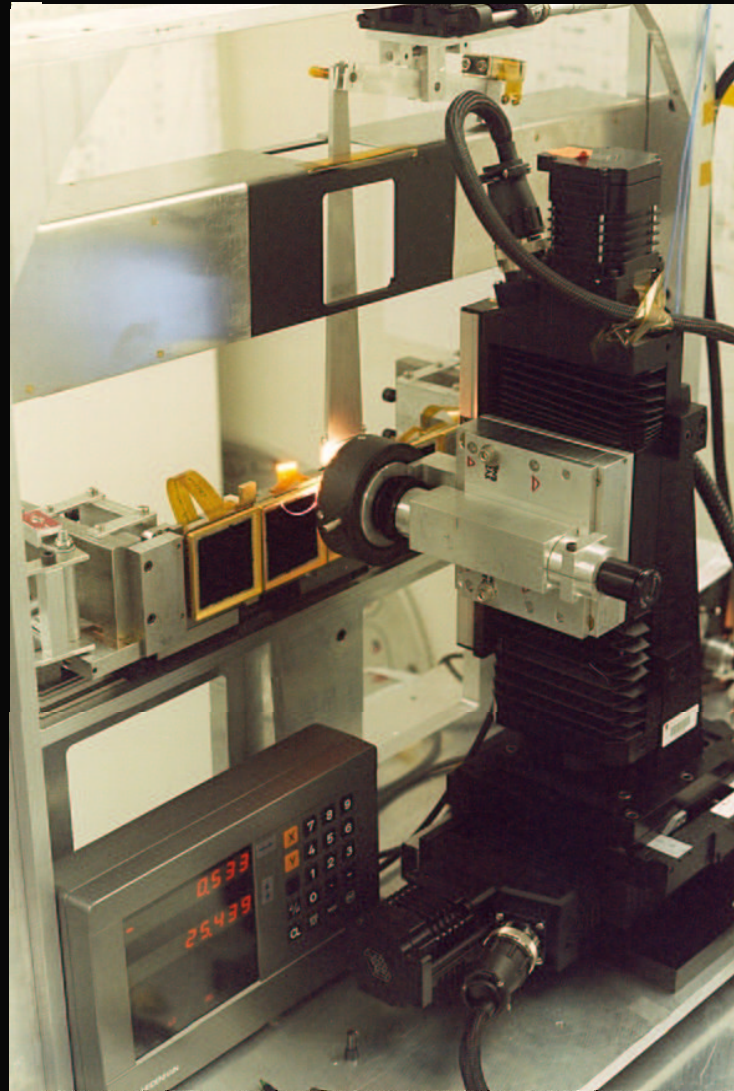
- Driftscanning, Astrometry set requirements
- Quartz for mechanical strength, thermal stability
- Kinematic mount optical benches on corrector

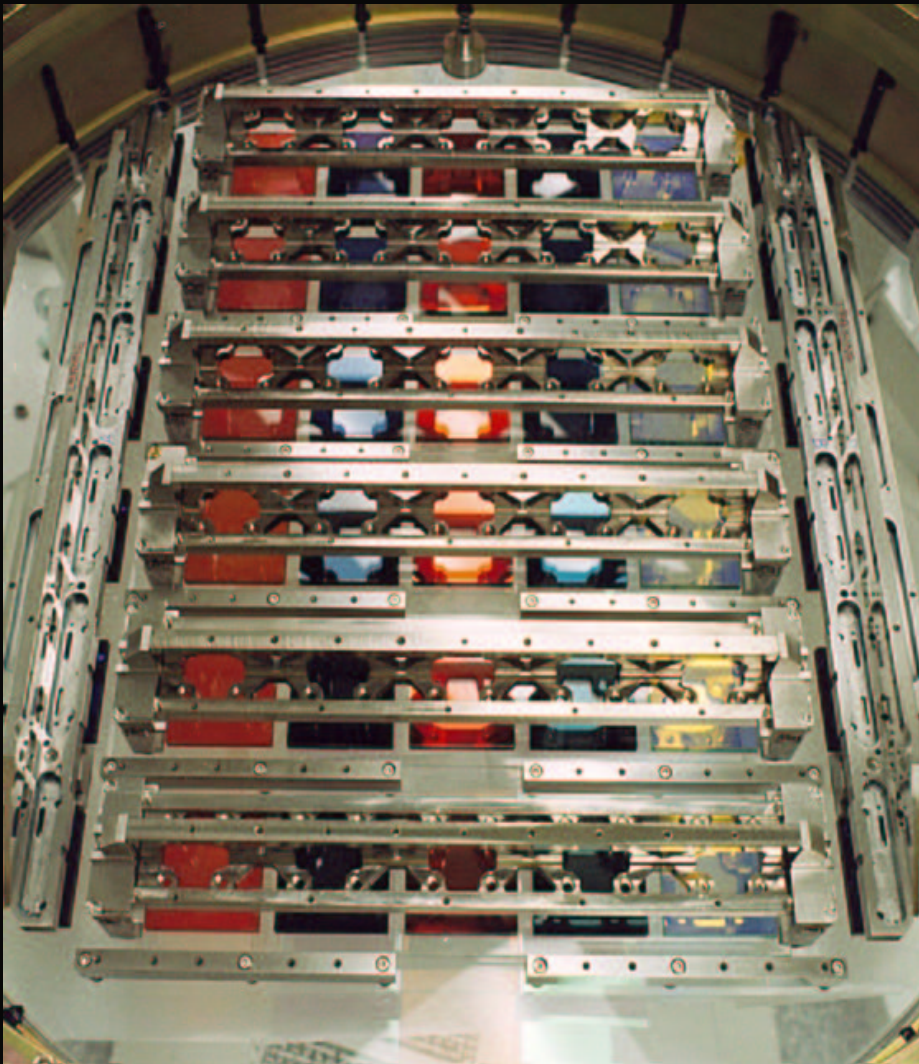
CCD Optical Benches



- Tip, tilt, rotation adjustment for CCDs
- Thermal isolation
- Horizon to zenith flexure is 1.3μ along optical axis, 1μ in focal plane

- CCDs purchased without special packaging
- CCD rotation to 0.1°
- Tip, tilt piston to 25μ

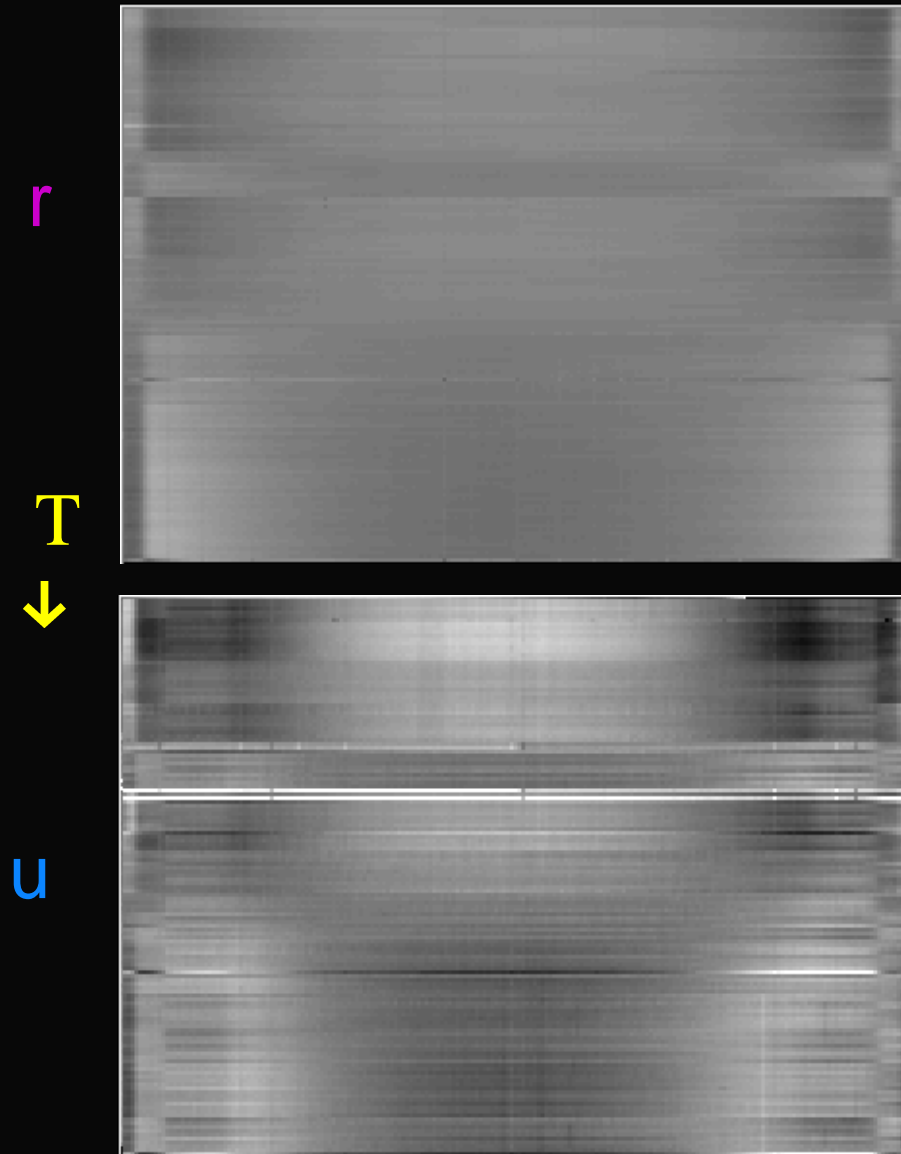




From atometric
processing of survey
data so far:

- CCD rotation,
scale, offsets
constant over time
- Small motions of
optical benches
- Residuals
correspond to 2.7μ
in 0.65m

Flatfielding and Photometry



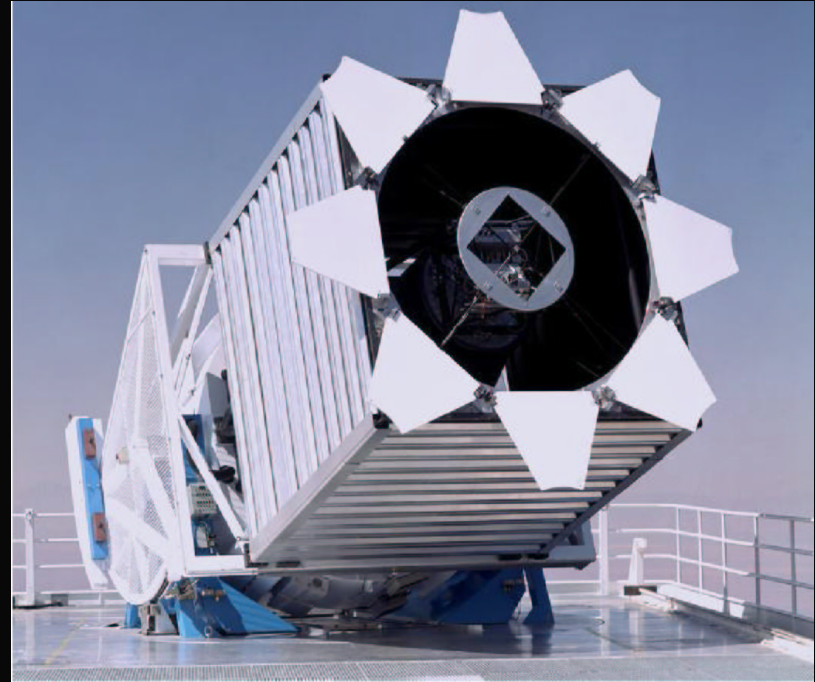
- background vectors
9/1998 - 1/2002
- $r \pm 2\%$
- $u > \pm 5\%$
- requirements: 2%
g,r,i 3% in u
- probably due to
vacuum effects
- solve using colors of
stars: impossible for
2D flats

Lessons Learned

- Be careful with coatings in vacuum
- Long lived CCDs
 - Because we read out all the time?
- Detector environment matters
 - Changes show up in the data
- Can't “just” look at this much data
 - Decouple pixel grabbing from everything else
- Data, hardware monitoring can work
 - But we wish we had more...

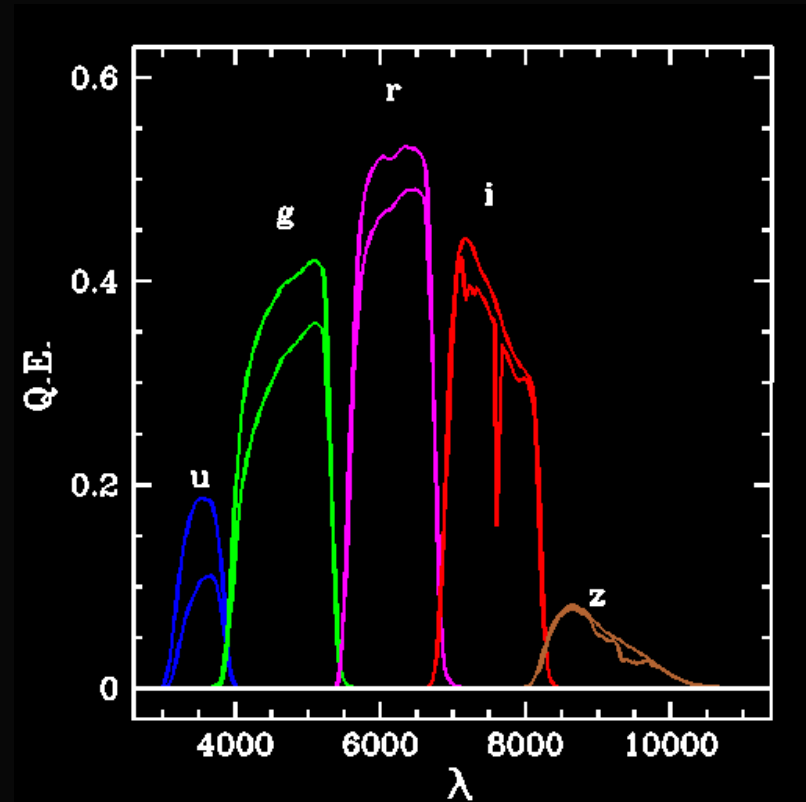
The Experiment

- Dedicated 2.5m telescope
 - wide field, optimized with instruments
- 2. Large-format CCD camera
 1. specialized for driftscanning
 2. 30 2048^2 CCDs
 3. 24 2048×400 astrometric CCDs
 4. full 2.5° dia. field in two passes



Filters

- atmospheric cutoff in UV, Si cutoff in IR
- u is entirely short of the Balmer jump
 - star, low-z QSO discrimination
 - 4000Å break



The SDSS: What it's All About

- Multicolor Survey of North Galactic Sky
95% complete at $r=22.2$
- Spectroscopic survey
 - color-selected QSO candidates
90% complete, 65% efficient
 - Flux-limited galaxy sample
 $r < 17.77$, $\langle z \rangle 0.104$
- Automated pipeline processing
- Spectroscopic targets from Imaging